In the Claims

1. (Original) An attenuation device, comprising:

a resistive circuit operable to couple to a tip wire and a ring wire of a twisted pair line; and

a capacitive circuit coupled in series to the resistive circuit, the capacitive circuit operable to permit normal operation of telephone services at a subscriber premises.

2. (Original) The attenuation device of Claim 1, wherein the capacitive circuit is further operable to filter out telephone signals received at the subscriber premises from a remote location.

3. (Original) The attenuation device of Claim 1, wherein the capacitive circuit is further operable to:

filter out telephone signals received at the subscriber premises from a remote location; and

provide a decreasing amount of attenuation for data signals in a transmit frequency band as frequency of the data signals increases.

4. (Original) The attenuation device of Claim 1, wherein the capacitive circuit is further operable to:

filter out telephone signals received at the subscriber premises from a remote location;

provide a decreasing amount of attenuation for data signals in a transmit frequency band as frequency of the data signals increases; and

provide a substantially consistent amount of attenuation for data signals in a receive frequency band.

5. (Original) The attenuation device of Claim 4, wherein:

the telephone signals have a frequency approximately below 4 KH_z;

the data signals in the transmit frequency band have a frequency approximately between 25 KH_z and 270 KH_z; and

the data signals in the receive frequency band have a frequency approximately between 270 KH_z and 1 MH_z.

6. (Original) The attenuation device of Claim 4, wherein the amount of substantially consistent attenuation in the receive frequency band is approximately 5 dB.

7. (Original) The attenuation device of Claim 1, further comprising:

a first line interface coupled to the capacitive circuit; and

a second line interface coupled to the resistive circuit opposite the capacitive circuit, the first and second line interfaces operable to couple to the twisted pair line.

8. (Original) The attenuation device of Claim 1, wherein the resistive circuit comprises an H-pad attenuator.

9. (Original) The attenuation device of Claim 1, wherein the resistive circuit comprises an H-pad attenuator, the H-pad attenuator comprising:

a first resistive element coupled in parallel to a second resistive element;

a third resistive element coupled in series to the first resistive element;

a fourth resistive element coupled in parallel to the third resistive element, the fourth resistive element further coupled in series to the second resistive element; and

a fifth resistive element coupled in series between the first, second, third, and fourth resistive elements.

10. (Original) The attenuation device of Claim 1, wherein the capacitive circuit comprises a first capacitive filter and a second capacitive filter, the first capacitive filter operable to couple to the tip wire of the twisted pair line and the second capacitive filter operable to couple to the ring wire of the twisted pair line.

11. (Original) The attenuation device of Claim 1, wherein:

the capacitive circuit comprises a first capacitive filter and a second capacitive filter, the first capacitive filter operable to couple to the tip wire of the twisted pair line and the second capacitive filter operable to couple to the ring wire of the twisted pair line; and

the resistive circuit comprises a H-pad attenuator, the H-pad attenuator comprising:

a first resistive element coupled in series to the first capacitive filter;

a second resistive element coupled in series to the second capacitive filter;

a third resistive element coupled in series to the first resistive element;

a fourth resistive element coupled in series to the second resistive element; and

a fifth resistive element coupled in series between the first, second, third and fourth resistive elements.

12. (Original) The attenuation device of Claim 11, wherein the first and second capacitive filters comprise a sixth resistive element coupled in parallel to a capacitive element.

13. (Previously Presented) The attenuation device of Claim 12, wherein:

the capacitive element comprises a capacitor approximately of 1 microfarad;

the fifth resistive element comprises a resistor approximately of 100 ohms; and

the sixth resistive element comprises a resistor of approximately 1 megaohms.

14. (Original) The attenuation device of Claim 1, wherein the resistive circuit is operable to model a length of twisted pair line between the subscriber premises and a remote location.

15. (Original) The attenuation device of Claim 1, further comprising:

a plurality of resistive circuits, each resistive circuit operable to model a length of twisted pair line between the subscriber premises and a remote location; and

a selector coupled to the capacitive circuit, the selector operable to select one of the resistive circuits.

16. (Currently Amended) A digital subscriber line (xDSL) communications device comprising:

a selector located in a housing;

an attenuation device located in the housing and coupled to the selector, the attenuation device comprising:

a resistive circuit having a first end and a second end; and

a plurality of capacitive circuits coupled in series between the first end of the resistive circuit and the selector, the capacitive circuits comprising a plurality of resistive elements coupled in parallel to a plurality of capacitive elements, the capacitive circuits operable to permit normal operation of telephone services at a subscriber premises;

a bi-directional variable gain amplifier located in the housing and coupled to the selector and the second end of the resistive circuit;

a gain control circuit located in the housing and coupled to the amplifier;

a processor located in the housing and coupled to the gain control circuit and the amplifier; ~~the amplifier; and~~

a line interface coupled to the selector and the capacitive circuits, the interface operable to communicate over a twisted pair line; ~~a twisted pair line.~~

wherein the processor is operable to

train the xDSL communications device at a data transmission rate;

receive a measured signal strength from the gain control circuit of a data signal received from a remote location using the twisted pair line after the xDSL communications device trains;

calculate an amplification for the data signal based on the measured signal strength; and

communicate the calculated amplification to the gain control circuit, the gain control circuit operable to adjust the gain of the amplifier; and

wherein the gain control circuit adjusts the gain of the amplifier by

increasing the gain of the amplifier if the measured signal strength is below a first value;

decreasing the gain of the amplifier if the measured signal strength is above the first value and below a second value; and

eliminating the gain of the amplifier if the measured signal strength is above the second value.

17. (Cancelled)

18. (Cancelled)

19. (Original) The communications device of Claim 16, wherein the capacitive circuits are further operable to filter out telephone signals received from a remote location over the twisted pair line.

20. (Original) The communications device of Claim 16, wherein the capacitive circuits are further operable to:

filter out telephone signals received from a remote location over the twisted pair line; and

provide a decreasing amount of attenuation for data signals in a transmit frequency band as frequency of the data signals increases.

21. (Original) The communications device of Claim 16, wherein the capacitive circuits are further operable to:

filter out telephone signals received from a remote location over the twisted pair line

provide a decreasing amount of attenuation for data signals in a transmit frequency band as frequency of the data signals increases; and

provide a substantially consistent amount of attenuation for data signals in a receive frequency band.

22. (Original) The communications device of Claim 21, wherein:

the telephone signals have a frequency approximately below 4 KH_z;

the data signals in the transmit frequency band have a frequency approximately between 25 KH_z and 270 KH_z; and

the data signals in the receive frequency band have a frequency approximately between 270 KH_z and 1 MH_z.

23. (Original) The communications device of Claim 16, wherein the resistive circuit comprises an H-pad attenuator.

24. (Original) The communications device of Claim 16, wherein the resistive circuit is operable to model a length of twisted pair line between a subscriber premises and a remote location.

25. (Original) The communications device of Claim 16, further comprising a plurality of attenuation devices coupled to the selector, each device operable to model a different length of twisted pair line between the subscriber premises and the remote location.

26. (Original) The communications device of Claim 25, wherein the selector is operable to select one of the plurality of attenuation devices.

27. (Original) A method for improving the performance of an xDSL modem located at a subscriber premises, the method comprising:

filtering out telephone signals received from a remote location over a twisted pair line;

receiving first data signals in a transmit frequency band from the xDSL modem and second data signals in a receive frequency band from the remote location through capacitive coupling; and

attenuating the first data signals in the transmit frequency band and the second data signals in the receive frequency band with a resistive circuit, the amount of attenuation decreasing as frequency increases for the first data signals in the transmit frequency band and the amount of attenuation remaining substantially consistent for the second data signals in the receive frequency band.

28. (Original) The method of Claim 27, wherein the step of attenuating the first data signals in the transmit frequency band and the second data signals in the receive frequency band with the resistive circuit comprises increasing the effective distance between the xDSL modem and the remote location by modeling a length of twisted pair line.

29. (Original) The method of Claim 27, wherein:

the telephone signals have a frequency approximately below 4 KH_z;

the data signals in the transmit frequency band have a frequency approximately between 25 KH_z and 270 KH_z; and

the data signals in the receive frequency band have a frequency approximately between 270 KH_z and 1 MH_z.

30. (Original) The method of Claim 27, wherein the resistive circuit comprises a H-pad attenuator.

31. (Original) The method of Claim 27, further comprising:

measuring a strength of one the first data signals in the transmit frequency band or one of the second data signals in the receive frequency band with a gain control circuit located in the xDSL modem;

calculating an appropriate amount of attenuation based on the measured signal strength with a processor; and

adjusting the gain of the transmit or receive amplifiers based on the calculated amplification using the gain control circuit.

32. (Original) The method of Claim 31, wherein the step of adjusting the gain of the transmit and receive amplifier based on the calculated amplification comprises:

increasing the gain of the transmit and receive amplifiers if the measured signal strength is below a first level;

decreasing the gain of the transmit and receive amplifiers if the measured signal strength is above the first level and below a second level; and

eliminating the gain of the transmit and receive amplifiers if the measured signal strength is above the second level.

33. (Original) The method of Claim 27, further comprising: attenuating the first data signals in the transmit frequency band and the second data signals in the receive frequency band with one of a plurality of resistive circuits, each of the resistive circuits operable to model a different length of twisted pair line between the subscriber premises and the remote location.

34. (Original) The method of Claim 27, further comprising:

attenuating the first data signals in the transmit frequency band and the second data signals in the receive frequency band with one of a plurality of resistive circuits, each of the resistive circuits operable to model a different length of twisted pair line between the subscriber premises and the remote location; and

selecting the resistive circuit based on a signal strength of a data signal in the transmit frequency band of a data signal in the receive frequency band, the signal strength measured by a processor located in the xDSL modem.

35. (Original) An attenuation device, comprising:

means for filtering out telephone signals and receiving first data signals in a transmit frequency band and second data signals in a receive frequency band, the filtering means permitting normal operation of telephone services at a subscriber premises; and

means for attenuating the first data signals in the transmit frequency band and the second data signals in the receive frequency band, the attenuating means coupled to the filtering means, the amount of attenuation decreasing as frequency increases for first data signals in the transmit frequency band and the amount of attenuation remaining substantially consistent for second data signals in the receive frequency band.

36. (Original) The device of Claim 35, wherein:

the telephone signals have a frequency approximately below 4 KH_z;

the data signals in the transmit frequency band have a frequency approximately between 25 KH_z and 270 KH_z; and

the data signals in the receive frequency band have a frequency approximately between 270 KH_z and 1 MH_z.

37. (Original) The device of Claim 36, wherein the attenuating means comprises a H-pad attenuator.

38. (Original) The device of Claim 35, wherein the filtering means comprises a plurality of capacitive elements coupled in parallel to a plurality of resistive elements.

39. (Original) The device of Claim 35, wherein the attenuating means is operable to model a length of twisted pair line between a subscriber premises and a remote location.